

WHAT IS CLAIMED IS:

1. A method for assembling a gas turbine engine including a compressor and a combustor, said method comprising:

providing a heat exchanger assembly that includes at least one heat exchanger; and

coupling the heat exchanger assembly to the gas turbine engine such that the heat exchanger is positioned substantially concentrically with respect to a gas turbine engine axis of rotation, and such that the heat exchanger is configured to receive compressor discharge air and channel the compressor discharge air to the combustor.

2. A method in accordance with Claim 1 wherein coupling the heat exchanger assembly to the gas turbine engine further comprises:

coupling an annular heat exchanger to an outer casing; and

coupling the outer casing to a gas turbine rear frame such that the annular heat exchanger is substantially concentric with a gas turbine engine rotational axis.

3. A method in accordance with Claim 1 wherein coupling the heat exchanger assembly to the gas turbine engine further comprises coupling a heat exchanger assembly including a fixed plug nozzle to a gas turbine rear frame such that a fixed quantity of compressor air is channeled through the heat exchanger.

4. A method in accordance with Claim 1 wherein coupling the heat exchanger assembly to the gas turbine engine further comprises coupling a heat exchanger assembly including a variable plug nozzle to the gas turbine engine to facilitate channeling a variable quantity of compressor air through the heat exchanger.

5. A method in accordance with Claim 4 further comprising coupling a translation apparatus to the variable plug nozzle to facilitate regulating the quantity of compressor air channeled through the heat exchanger.

6. A method in accordance with Claim 5 wherein coupling a translation apparatus further comprises coupling at least one of a mechanical device, a hydraulic device, and a pneumatic device to the variable plug nozzle to facilitate regulating the quantity of compressor air through the heat exchanger.

7. A method in accordance with Claim 1 wherein the heat exchanger includes a plurality of heat exchanger elements, each heat exchanger element including an inlet side in flow communication with an inlet manifold and an outlet side in flow communication with an outlet manifold, and wherein coupling the heat exchanger assembly to the gas turbine engine further comprises coupling the inlet manifold to the gas turbine compressor and coupling the outlet side to the gas turbine combustor.

8. A heat exchanger assembly for a gas turbine engine, said heat exchanger assembly comprising:

an annular heat exchanger coupled in flow communication to a compressor, said heat exchanger configured to channel compressor discharge air to a combustor, said heat exchanger assembly coupled to said gas turbine engine such that said heat exchanger is substantially concentrically aligned with respect to an axis of rotation of the gas turbine engine.

9. A heat exchanger assembly in accordance with Claim 8 further comprising an outer casing coupled to said heat exchanger and to a gas turbine rear frame such that said annular heat exchanger is substantially concentrically aligned with respect to an axis of rotation of the gas turbine engine.

10. A heat exchanger assembly in accordance with Claim 8 further comprising a plug nozzle fixedly secured to a gas turbine rear frame to facilitate controlling an amount of compressor air channeled through said heat exchanger.

11. A heat exchanger assembly in accordance with Claim 8 further comprising a plug nozzle coupled to a gas turbine rear frame, said plug nozzle moveable with respect to said heat exchanger to facilitate channeling compressor air through said heat exchanger.

12. A heat exchanger assembly in accordance with Claim 11 further comprising a translation apparatus coupled to said plug nozzle to facilitate regulating the quantity of compressor air through said heat exchanger.

13. A heat exchanger assembly in accordance with Claim 12 wherein said translation apparatus comprises at least one of a mechanical device, a hydraulic device, and a pneumatic device.

14. A heat exchanger assembly in accordance with Claim 12 further comprising a drive mechanism coupled to said translation device, said drive mechanism configured to selectively translate said plug nozzle to facilitate regulating the quantity of compressor air through said heat exchanger.

15. A heat exchanger assembly in accordance with Claim 8 further comprising:

an inlet manifold coupled in flow communication with said compressor;

an outlet manifold coupled in flow communication with said combustor; and

wherein said heat exchanger comprises a plurality of heat exchanger elements, each said heat exchanger element comprising an inlet side in flow

communication with said inlet manifold and an outlet side in flow communication with said outlet manifold.

16. A heat exchanger assembly in accordance with Claim 15 wherein said inlet manifold comprises a cross-sectional area that is inversely proportional to a cross-sectional area of said outlet manifold.

17. A gas turbine engine comprising:

a compressor;

a combustor downstream from said compressor;

a turbine coupled in flow communication with said combustor; and

a heat exchanger assembly comprising:

an annular heat exchanger coupled in flow communication to a compressor, said heat exchanger configured to channel compressor discharge air to a combustor, said heat exchanger assembly coupled to said gas turbine engine such that said annular heat exchanger is substantially concentrically aligned with respect to an axis of rotation of the gas turbine engine.

18. A gas turbine engine in accordance with Claim 17 wherein said heat exchanger assembly further comprises a plug nozzle fixedly secured to a gas turbine rear frame to facilitate controlling an amount of compressor air channeled through said heat exchanger.

19. A gas turbine engine in accordance with Claim 17 wherein said heat exchanger assembly further comprises a plug nozzle coupled to a gas turbine rear frame, said plug nozzle moveable with respect to said heat exchanger to facilitate channeling compressor air through said heat exchanger..

20. A gas turbine engine in accordance with Claim 19 wherein said heat exchanger assembly further comprises:

135830

a translation apparatus coupled to said plug nozzle to facilitate regulating the quantity of compressor air through said heat exchanger; and

a drive mechanism coupled to said translation device, said drive mechanism configured to selectively translate said plug nozzle to facilitate regulating the quantity of compressor air through said heat exchanger.